PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ...	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/CA2003/001469	International filing date *(day/month/year)* 03.10.2003	Priority date *(day/month/year)* 03.10.2003
International Patent Classification (IPC) or both national classification and IPC E04C5/12		
Applicant UNIVERSITY OF WATERLOO et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
19.04.2005	19.01.2006
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Vratsanou, V Telephone No. +49 89 2399-7142

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CA2003/001469

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-8 as originally filed

Claims, Numbers

1-27 as amended (together with any statement) under Art. 19 PCT

Drawings, Sheets

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☒ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

   see separate sheet

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	5-10,14,18,25-26
	No:	Claims	1-4,11-13,15-17,19-24
Inventive step (IS)	Yes:	Claims	
	No:	Claims	5-10,14,18,25-26
Industrial applicability (IA)	Yes:	Claims	1-26
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item I
Basis of the report

I.1 The amendments filed with the International Bureau under Article 19(1) introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 19(2) PCT. The amendments concerned are the following:

I.11 Addition of the expression "said wedges not extending beyond the rod receiving face of said barrel when said wedge anchor is in its loaded configuration" in the amended claims 1, 16, 19, 23, 24, 25 (cf. page 4, lin. 21-23, of the description as originally filed: "the wedges 21 ... do not extend beyond the rod receiving face 15 of the barrel 11 when the wedge anchor 10 is in its assembled and secured configuration").

I.12 Replacement of the expression "to break rod" (cf. claim 18 as originally filed) with the expression "to cause tensile failure of said rod at a point away from said anchor" in the amended claim 18.

I.13 Addition of the expression "wherein when said anchor is in said loaded configuration, the maximum tensile load applicable is determined by the tensile properties of said fibre-reinforced polymer rod" in the amended claim 25.

I.14 Addition of the expression "said outer wedge face having a wedge-face centre of radius of curvature, which is offset relative to said barrel centre of radius of curvature" in the amended claim 27.

I.2 Hence, the International Preliminary Examination Report (IPER) will be established on the basis of the claims as originally filed (Rule 70.2(c) PCT).

Re Item V
Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

V.1 Reference is made to the following documents, cited in the International Search Report:

D1: GB-A-1 152 434
D2: WO 99/67549 A
D3: FR-A-2 708 017
D4: EP-A-0 949 389

D5: US-A-5 802 788
D6: DE 100 10 564 C
D7: US-A-6 082 063 (cited in the application)

Claims 1-15

V.2 The document D1 or D2 is regarded as being the closest prior art to the subject-matter of claim 1.

D1 discloses (the references in *italic* applying to this document):

a) a wedge anchor (*fig. 4; page 1, lin. 83 - page 2, lin. 2*) comprising;

b) a barrel *2* having a wedge receiving face (right surface of *2* in *fig. 4*) opposite a rod receiving face (left surface of *2* in *fig. 4*), a passage extending therethrough between said wedge receiving face and said rod receiving face, said passage narrowing toward said rod receiving face and having an axial cross-sectional profile defining a convex arc (*fig. 4; page 3, lin. 81-90*); and,

c) a plurality of wedges *(page 3, lin. 99-106)* insertable into said passage, each of said wedges having a respective inner wedge face for defining a rod receiving passage for receiving a rod *1* and an outer wedge face, opposite said inner wedge face, in axial cross-section having a profile complementary to said convex arc (*fig. 4; page 3, lin. 81-90*).

D2 discloses (the references in *italic* applying to this document):

a) a wedge anchor (*fig. 1, 7*) comprising;

b) a barrel *4* having a wedge receiving face (upper surface of *4* in *fig. 1, 7*) opposite a rod receiving face (bottom surface of *4* in *fig. 1, 7*), a passage extending therethrough between said wedge receiving face and said rod receiving face, said passage narrowing toward said rod receiving face and having an axial cross-sectional profile defining a convex arc (*fig. 1, 7; page 11, lin. 1-10: "... la paroi de l'orifice 3 convexe ..."*); and,

c) a plurality of wedges *6, 7* insertable into said passage, each of said wedges *6, 7* having a respective inner wedge face for defining a rod receiving passage for receiving a rod *5* (*page 7, lin. 28-30*) and an outer wedge face, opposite said inner wedge face (*fig. 7-9*), in axial cross-section having a profile complementary to said convex arc (*fig. 7; page 11, lin. 1-10: "La surface extérieure des clavettes pourrait par exemple être concave ..."*).

Hence, the subject-matter of claim 1 is not new (Article 33(2) PCT).

V.3 The additional features of the dependent claims 2-4, 11-13, 15 are also known:

- for claim 2: see D1 (fig. 4) or D2 (page 11, lin. 1-10);
- for claim 3: see D2 (page 9, lin. 8-12);
- for claim 4: see D2 (fig. 7);
- for claim 11-12: see D2 (fig. 9);

- for claim 13: see D1 (page 4, lin. 43-53);
- for claim 15: see D1 (fig. 4).

Hence, the subject-matter of these claims is also not new.

V.4 Inasmuch as the additional features of each of the dependent claims 5-10, 14 are not directly known from the documents cited in V.1 above, they concern only minor modifications which lie within the normal practice of the person skilled in the art, especially as the advantages thus achieved can readily be foreseen. Reference can be made e. g. to the following documents:

- for claims 5-7: D4 (*fig. 1, col. 3, lin. 37-41: Schutzelemente 5*);
- for claims 8-10: D5 (*col. 9, lin. 7-12*);
- for claims 14: D6 (*col. 3, lin. 16-20*).

Hence, the subject-matter of these claims lacks an inventive step (Article 33(2) PCT).

Claims 16-17

V.5 The same reasoning as the reasoning given for claim 1, see V.2 above, applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 16, which therefore are also considered not new.

V.6 The same reasoning as the reasoning given for the dependent claim 3, see V.3 above, applies, mutatis mutandis, to the subject-matter of the dependent claim 17, which therefore is also considered not new.

Claim 18

V.7 The document D5 is regarded as being the closest prior art to the subject-matter of claim 18, and discloses (the references in *italic* applying to this document):

a) a method of testing the tensile strength (*col. 6, lin. 1*) of a fibre reinforced polymer rod (*col. 6, lin. 6*) comprising the steps of:
b) securing a wedge anchor *2* to a rod end portion *1* (*fig. 5-7*);
c) applying a tensile force to said wedge anchor sufficient to break rod (*col. 6, lin. 23-24*);
d) and measuring the applying force (*col. 6, lin. 25*).

The subject-matter of claim 18 therefore differs from this known method in that:

e) [said wedge anchor is configured] according to claim 1, the subject-matter of which is not new, see V.2 above.

The skilled person would therefore regard it as a normal procedure to apply this known method for performing a tension test (features a)-d)) to the known wedge anchor (feature e)) in order to define the tensile strength of the rod. Hence, the subject-matter of claim 18 lacks

an inventive step.

Claims 19-22, 23, 24

V.8 The same reasoning as the reasoning given for claim 1, see V.2 above, applies, mutatis mutandis, to the subject-matter of the corresponding independent claims 19, 23, 24, which therefore are also considered not new.

V.9 The same reasoning as the reasoning given for claims 1, 2, 15, see V.2 and V.3 above, applies, mutatis mutandis, to the subject-matter of the dependent claims 20, 21, 22, which therefore are also considered not new.

Claims 25-26

V.10 The document D2 is regarded as being the closest prior art to the subject-matter of claim 25, and discloses (the references in *italic* applying to this document):

a) a wedge anchor (*fig. 1, 7*) comprising:

b) a barrel *4* having a wedge receiving face (upper surface of *4* in *fig. 1, 7*) opposite a rod receiving face (bottom surface of *4* in *fig. 1, 7*), a passage extending therethrough between said wedge receiving face and said rod receiving face, said passage narrowing toward said rod receiving face and having an axial cross-sectional profile defining a convex arc (*fig. 1, 7; page 11, lin. 1-10: "... la paroi de l'orifice 3 convexe ..."*);

c) four wedges *6, 7* of equal size (*fig. 9*) insertable into said passage, each of said wedges *6, 7* having a respective inner wedge face for defining a rod receiving passage for receiving a rod *5* (*page 7, lin. 28-30*) and an outer wedge face, opposite said inner wedge face (*fig. 7-9*), in axial cross-section having a profile complementary to said convex arc defining a concave arc (*fig. 7; page 11, lin. 1-10: "La surface extérieure des clavettes pourrait par exemple être concave ..."*); and,

d) a sleeve insertable into said rod receiving passage for receiving an end portion of said rod (*page 9, lin. 8-12*).

The subject-matter of claim 25 therefore differs from this wedge anchor in that:

e1) [said barrel is made of] steel;

e2) [said wedges are made of] steel;

e3) said sleeve is comprised of a malleable metal.

e4) [said convex arc] having a constant arc radius;

e5) [said concave arc] having a constant arc radius.

The separate features e1), e2), e3), e4), e5) consist merely in the selection of particular materials or dimensions from a limited range of possibilities, which are known to the skilled

person, see e. g. D1 (*page 4, lin. 43-53*), D6 (*col. 3, lin. 16-20*), D5 (*col. 9, lin. 7-12*) or D4 (*paragraph [0014]*. This selection is not inventive, since no unexpected effects or properties in relation to the rest of the range are indicated in the application, that would had made such a selection inventive,
Apart from this there is no indication in the description that there is a functional synergic relationship between the above separate features (see e. g.: page 2, lin. 5-21: "The convex arc may define a radius of curvature"; The wedge anchor may further comprise a sleeve ..., that may be comprised of a malleable material..."; page 5, lin. 1-5: "the barrel 11 and wedges 21 may be comprised of ... steel ...").
Since claim 25 is merely an aggregation of known features and not a true combination (PCT-Guidelines 13.05), its subject-matter lacks an inventive step.

V.11 The additional features of the dependent claim 26 are also disclosed in D2 (*fig. 1, 7, 15*). Hence, the subject-matter of this claim also lacks an inventive step.

Certain defects in the international application (form or content)

VII.1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 or D2 is not mentioned in the description, nor are these documents identified therein.

VII.2 Independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT.

VII.3 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).